

Claims

- ~~1.~~ A transgenic rodent having a genome comprising a polynucleotide encoding a human UCP3 polypeptide under the control of a regulatory sequence facilitating expression of said polypeptide.
- ~~2.~~ A transgenic rodent according to claim 1 wherein the polynucleotide encoding a human UCP3 polypeptide is selected from the group consisting of:
- 10 (a) a polynucleotide comprising a polynucleotide sequence having at least 95%, 96%, 97%, 98%, or 99% identity to the polynucleotide sequence of SEQ ID NO:1;
- (b) a polynucleotide comprising the polynucleotide of SEQ ID NO:1;
- (c) a polynucleotide having at least 95%, 96%, 97%, 98%, or 99% identity to the polynucleotide of SEQ ID NO:1;
- 15 (d) the polynucleotide of SEQ ID NO:1;
- (e) a polynucleotide comprising a polynucleotide sequence encoding a polypeptide sequence having at least 95%, 96%, 97%, 98%, or 99% identity to the polypeptide sequence of SEQ ID NO:2;
- (f) a polynucleotide comprising a polynucleotide sequence encoding the polypeptide of SEQ 20 ID NO:2;
- (g) a polynucleotide having a polynucleotide sequence encoding a polypeptide sequence having at least 95%, 96%, 97%, 98%, or 99% identity to the polypeptide sequence of SEQ ID NO:2;
- (h) a polynucleotide encoding the polypeptide of SEQ ID NO:2;
- 25 (i) a polynucleotide having or comprising a polynucleotide sequence that has an Identity Index of 0.95, 0.96, 0.97, 0.98, or 0.99 compared to the polynucleotide sequence of SEQ ID NO:1; and
- (j) a polynucleotide having or comprising a polynucleotide sequence encoding a polypeptide sequence that has an Identity Index of 0.95, 0.96, 0.97, 0.98, or 0.99 compared to the polypeptide sequence of SEQ ID NO:2.

3. A transgenic rodent according to claim 1 or 2 wherein the rodent is selected from the group consisting of:

- a) mouse; and
- b) rat.

4. A transgenic rodent according to any one of claims 1 to 3 wherein the polynucleotide encodes a human UCP3 polypeptide of SEQ ID NO:2.

5. A transgenic rodent according to any one of claims 1 to 4 wherein the

10 polynucleotide encoding a human UCP3 polypeptide is the polynucleotide of SEQ ID NO:1.

6. The transgenic rodent of any one of claims 1 to 5 wherein the human UCP3 polypeptide is expressed predominantly in skeletal muscle.

15 7. The transgenic rodent of claim 6 wherein the expression in skeletal muscle is facilitated by a muscle specific promoter.

8. The transgenic rodent of claim 7 wherein the skeletal muscle-specific promoter is
20 alpha-actin.

9. The transgenic rodent of any one of claims 1 to 8 exhibiting reduced body weight.

25 10. The transgenic rodent of any one of claims 1 to 8 exhibiting increased wound-healing.

11. A method of producing the transgenic rodent of any one of the preceding claims comprising the steps:

- 30 a) preparing transgene construct comprising coding region of the gene of interest operably linked to an appropriate regulatory sequence;
- b) removing vector sequences by restriction digest;
- c) introducing the transgene into the rodent by pronuclear injection; and

d) re-transferring the injected eggs into the uteri of pseudo-pregnant recipient mothers.

12. A method of producing a transgenic rodent according to claim 11, wherein the rodent is a mouse and the transgene is introduced into mouse ES cells, using electroporation, retroviral vectors or lipofection for gene transfer.

13. A transgene comprising a polynucleotide encoding the human UCP-3 polypeptide operably linked to a rodent regulatory sequence.

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14. A transgene according to claim 13 wherein the rodent regulatory sequence is the alpha-actin promoter.

15. A method of determining the phenotypic effect of a compound comprising exposing a transgenic rodent of any one of claims 1 to 10 to said compound and determining changes in phenotype.

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16. A method according to claim 15 wherein the phenotype is that of a UCP3-related disease selected from obesity, diabetes, hyperlipidaemia, body weight disorders, wound

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healing, cachexia, inflammation, tissue repair and atherosclerosis